

THE AMEGHINOS' LOCALITIES FOR EARLY CENOZOIC MAMMALS IN PATAGONIA

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INTRODUCTION

Early Cenozoic South American mammals, earlier than what was then called the *Pyrotherium* (now Deseadan) fauna, were discovered in Patagonia by Carlos Ameghino on his expedition of 1895–1896. They were first published by Carlos' elder, more articulate brother Florentino in 1897 (see Ameghino, 1897). It was not then recognized that the collections in hand included older forms, and at that time all were considered as from the "couches à *Pyrotherium*." On his expedition of 1898–1899, Carlos observed that there was included an older fauna, for which he suggested the name *Notostylops* fauna, and at the beginning of his following summer's work, 1899–1900, he noted that in fact there were two pre-*Pyrotherium* faunas. These observations were made to Florentino in letters from Carlos, 15 February 1899 and 9 October 1899, published much later in volume 21 of the "Obras completas" (Ameghino, 1913–1936). Florentino applied the name *Astraponotus* to the third fauna to be recognized, intermediate between the *Notostylops* and *Pyrotherium* faunas. The *Notostylops* fauna is now referred to the Casamayoran and the *Astraponotus* fauna to the Muster-

san. Carlos continued to collect from those early faunas into 1903, and he also was able to correct the allocation of specimens at first incorrectly ascribed to the *Pyrotherium*

fauna. Florentino continued to publish brief descriptions of the specimens and to name a great number of new genera and species in the pre-*Pyrotherium* (pre-Deseadan) faunas through 1904. In 1906 he summarized them, with full generic faunal lists, in his great work on the mammal-bearing sedimentary formations of Patagonia (Ameghino, 1906). Some, but not all, of his published diagnoses were accompanied by a statement as to locality, but so generalized that the actual sites could hardly be relocated from these data alone. Almost all the specimens of the Ameghino Collection, now in the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia," Buenos Aires, have taxonomic labels in Florentino's hand on small slips of paper and some, but far from all of these, have locality data in the same vague terms as those used in publication. The 1906 volume has sketch maps by Carlos showing exposures and assumed connections of the "notostylopéen" (Casamayoran stage) and "astraponotéen" (Muster-san stage), but these are crude and likewise rather vague. (That is not an adverse criticism; there were no adequate maps of interior Patagonia in 1903 and earlier, and Carlos necessarily worked under extremely primitive and difficult conditions.) Copies of those maps are given in Figures 1 and 2 of the present paper.

It is essential for the interpretation of these faunas and for further discovery and study to locate Carlos Ameghino's localities

as well as possible. Partly to that end, I followed in his footsteps in Patagonia in 1930–1931 and 1933–1934 (principal localities in Fig. 3 of this paper), and I studied the Ameghino Collection and compared it with later collections of more precisely known provenience. Periodically since 1934 I have worked on the systematic augmentation and revision of the pre-Deseadan faunas. Part one was published long since (Simpson, 1948), and part two, completing the systematics, has now been finished and is in the editor's hands. Available locality data for many of the Ameghinos' specimens are there given in their terms. Further discussion of those localities, attempts to place them more precisely, and lists of type specimens from them are the subjects of the present paper.

The most important data for this study were derived from lengthy discussions with Carlos Ameghino in 1931. It was then 28 years since he had been in Patagonia, and these discussions occurred during a remission in a long, eventually fatal illness. His memory at that time cannot be considered infallible, but it was exceptionally clear. He had been accustomed to keep field notes in his head rather than on paper, and while this is extremely unfortunate from one point of view, it did have the advantage of making his unaided memory more reliable. Of course since he had been exploring in mostly unmapped territory, he could not have precise memory of locations not precisely determined at the time. Most of his statements agree with all other available information, but in just one instance (specified below) his memory was demonstrably at fault. I took written notes of these discussions, so the present report does not add failures of my memory to the record.

CASAMAYORAN LOCALITIES

Colhué-Huapí. That is the official spelling of the name of the larger, more eastern of the two major central Patagonian lakes. The name was used in this form by Floren-

tino in publication. It does not, however, represent the local pronunciation, and the Ameghinos' specimen labels use variants that do represent local usage: Colhuapi, Coluapi, Colihuapi. This designates the great *barranca* (in Patagonia a cliff or scarp, not, as in some Spanish dialects, a ravine) south of the lake. It is not so distant from the lake or so extended north and south as suggested by Carlos' sketch map. In 1894–1895 Carlos had worked along a coastal area far to the southeast, including Punta Casamayor, now type locality for the Casamayor Formation and Casamayoran stage. However, at that time he did not find pre-Deseadan mammals there. He positively affirmed to me, and collection data and all other evidence are in accordance, that pre-Deseadan mammals were first found in 1895–1896 in this *barranca*. All the pre-Deseadan forms described in 1897 were from there. Both the "*Notostylops* fauna" and the "*Astraponotus* fauna," our Casamayoran and Mustersan faunas, were first found and (although later) recognized there, and a majority of all Ameghino specimens of both ages are from there. In fact the *barranca* has richly fossiliferous exposures of four stages in continuous sequence: Casamayoran, Mustersan, Deseadan, and Colhuahuapian, from bottom to top. It is the most imposing and important single known fossil mammal locality in South America, and one of the most important in the world. It must also be considered the greatest single discovery of Carlos Ameghino's extraordinary career. Among Ameghino's pre-Deseadan type specimens, 93 are labeled as from here, and according to Carlos most of the types not labeled as to locality are also from here.

A few specimens are indicated as from "Colhué-Huapí Sud." That is the same locality.

Oeste de Río Chico. The Río Chico is an intermittent stream carrying overflow from Lake Colhué-Huapí northeast to the Río Chubut. This designation by Carlos Ameghino refers to a long sequence of expo-

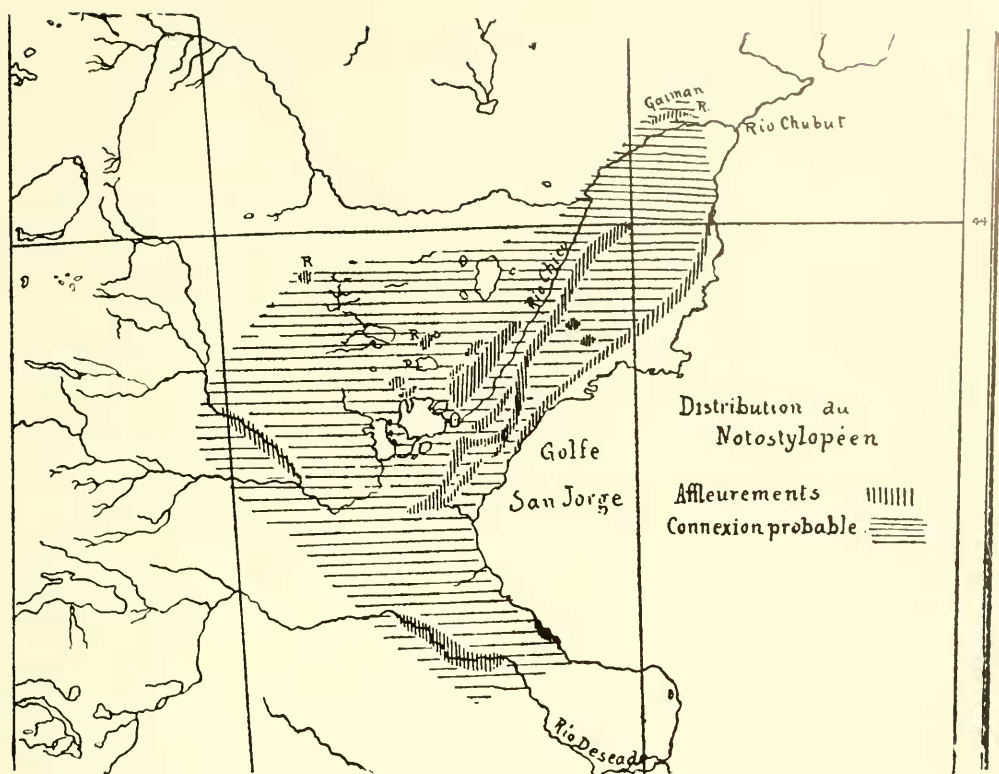


Fig. 1. Sketch map of central Patagonia with exposures and probable connections of the *Notostylops* beds (Casamayor Formation), by Carlos Ameghina. (From F. Ameghina, 1906, fig. 22.)

ures along the left, northwest bank of the Río Chico and on its small intermittent tributaries from the Pampa Pelada, along the upper third or half of the Río Chico valley between Lake Colhué-Huapí and the locality known to Carlos as Paso Niemann, called Puente Viejo or Puente Nollmann in the 1930's, and probably now called by still another name. (As in many sparsely inhabited areas, such as much of southwestern United States, map names in Patagonia are often unknown to the local inhabitants, and names used by them tend to change with each generation or oftener.)

Known fossil mammals from this region are all Casamayoran. Seventy-three Ameghino types are labeled as from this rather extensive area, and none can now be lo-

cated more precisely. The rich pocket designated Cañadón Vaca in our field data, found by us in December, 1930, is in this area, and the assemblage more nearly resembles the Ameghinos' specimens from "Oeste de Río Chico" than those from "Colhué-Huapí." Nevertheless, Carlos was quite positive that he had not found our Cañadón Vaca pocket and that although his "Oeste de Río Chico" specimens were from near there, none were found precisely there.

Río Chico 1er yac. Pyroth. This abbreviated specimen label stands for "Río Chico, primer yacimiento de *Pyrotherium*," "Río Chico, first site or deposit of the *Pyrotherium* fauna," although in fact it was not the first known locality for that fauna (= Deseadan). On at least one poorly legible

label the indication seems to be rather "fr" than "1er" and could stand for "frente" (opposite). In either case, Carlos confirmed that this is the very rich Deseadan locality later also worked with great success by Loomis (1914a) and called Cabeza Blanca. Loomis, sharply and unjustifiably critical of the Ameghinos, insisted that there are no *Notostylops* or Casamayoran beds at this locality, although in fact he camped on those beds for three weeks. Carlos did collect Casamayoran fossils there, but only a few, including one type. We also found a few Casamayoran fossils there and in similar exposures extending for a league or more down the valley from the hill ("cabeza") itself, on the same side of the watercourse.

Río Chico. Three types have only this general label. Carlos could not place them more exactly.

Río Chico frente a Malaspina. Malaspina is an occupied site west of Bahía Bustamante, about half way between the coast and the Río Chico. The fossil locality is on the Río Chico, approximately at its nearest point to Malaspina. This is northeast (down the valley) from Cabeza Blanca and, as confirmed by Don Carlos, it was the northernmost point where he found Casamayoran mammals. Only one type and one other specimen are labeled as from here.

Colhuapi [Colhué-Huapí] Norte. This is an important locality, but it remains somewhat uncertain. Ameghino's sketch map (1906, fig. 22; Fig. 1 of this paper) shows two localities north of Lake Colhué-Huapí, one across the peninsula that juts into the north part of the lake, indicated as including "notostylopéen" and "pyrothéréen" (Casamayoran and Deseadan), and one northwest of that, shown as including "notostylopéen" and "astraponotéen" (Casamayoran and Mustersan). Thirteen Casamayoran and two Mustersan types in the Ameghino Collection are labeled "Colhuapi norte." We found exposures of both those stages and also Deseadan in this general area and an especially rich Mustersan deposit, with less common Casamayoran and

Deseadan nearby, at a locality called (when we were there) Pajarito, on the west side of the Cerro del Humo. With allowance for the general inaccuracy of the Ameghino map and for its rotation of the lakes from their true orientation, our Pajarito could be precisely "Colhuapi norte," but Carlos emphatically denied this. He spoke of a single locality some distance from the lake on the slope of a meseta, probably in the vicinity of what was called the Sierra del Toro in the 1930's. The collections tend to support Don Carlos' opinion that the localities are not the same, ours being mostly Mustersan and his mostly Casamayoran (13 types, plus only 2 Mustersan). Also he found no Deseadan fossils there, and there are fairly evident fossiliferous Deseadan beds near our locality.

Santiago Roth, collecting for the La Plata Museum, found a rich Mustersan fauna at the locality that he called "Lago Musters" (see Simpson, 1936). This is almost certainly the same as our "Pajarito" or "Cerro del Humo," for our collection includes specimens of some of the same species preserved in the same way. By the same token, Roth's "Lago Musters" locality is probably not the Ameghinos' "Colhuapi norte." (Although the lake called "Musters" by Roth was in fact Colhué-Huapí and not the real Lago Musters.) The Ameghinos' maps do not show anything that could be Roth's "Lago Musters" locality, but do show a Casamayoran locality ascribed to Roth more to the north, perhaps near Cerro Talquino. There are in fact extensive mammal-bearing pre-Deseadan beds around Cerro Talquino, but I have been unable to equate these with any of Roth's highly inadequate site indications. Most of the information passed on by Roth to the Ameghinos was quite unreliable. Don Carlos' "Colhuapi norte" may possibly be Roth's "Lago Musters" and our "Pajarito" or "Cerro del Humo," but it is more likely that it has not been rediscovered. It is probably somewhat farther east than Carlos' sketch map indicates.

Pico Salamanca. This small peak is along

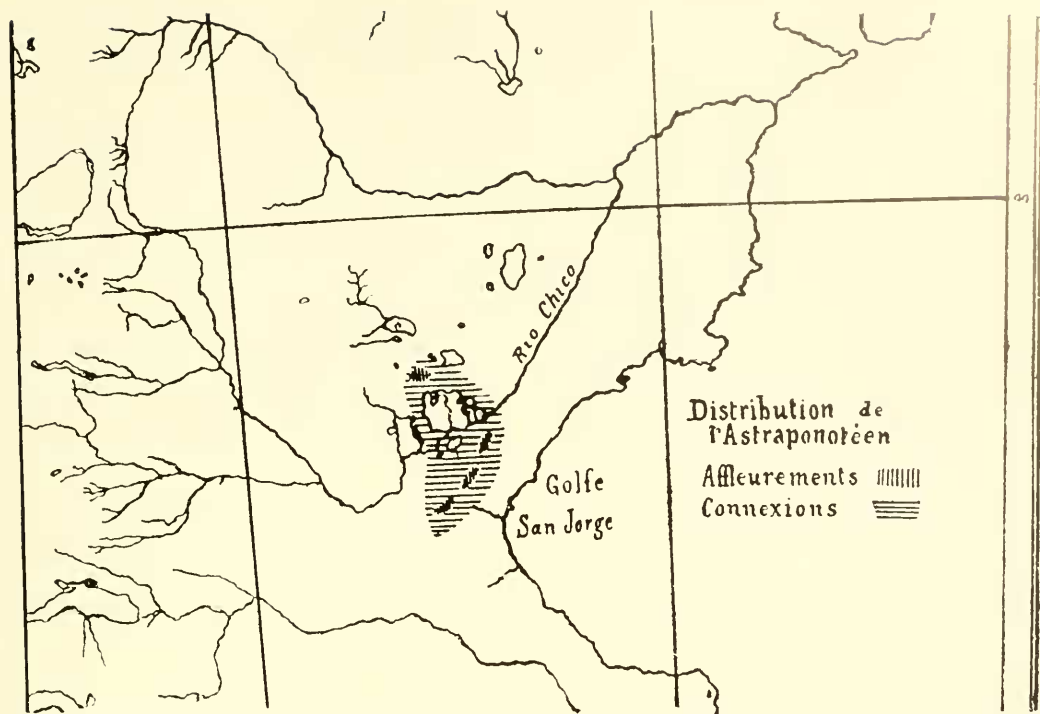


Fig. 2. Sketch map of central Patagonia with exposures and probable connections of the *Astraponotus* beds (Musters Formation), by Carlos Ameghino. (From F. Ameghino, 1906, fig. 23.)

the coast some 35 kilometers north of Comodoro Rivadavia. The peak itself includes no Casamayoran (nor Salamancan, although that stage is named for it), but it is surrounded by Casamayoran. Don Carlos said that fossils so labeled were gleaned over a large area in this general region. They include three types. Carlos' sketch map shows a long stretch of Casamayoran exposures roughly parallel to the coast, along the southeast flank of the Pampa de Castillo and the Meseta de Montemayor, approximately from Pico Salamanca to Punta Lobos. The formation does have about this extent, but the exposures are not as continuous as indicated.

Este de Río Chico. Don Carlos stated that this indication does not refer to the Río Chico valley but to the east slope of the Pampa de Castillo between the area called "Pico Salamanca" to the south and that

called "Malaspina" to the north. One type (*Thomashuxleya externa*) is so labeled.

Malaspina. By this name Don Carlos indicated the area below, east, of Malaspina, around our locality "Las Violetas." He found only scraps here, and while we considered some of the exposures probably Casamayoran we found no fossils in them.

Casamayor. Punta Casamayor is in Santa Cruz, on the coast of the Gulf of San Jorge, roughly halfway from Comodoro Rivadavia to Cabo Blanco. Casamayoran exposures occur, not at Punta Casamayor but southeast of there along the coast between that point and Puerto Mazaredo and especially in a small *cañadón* that the Ameghinos named after the French collector Tournouër, whom they guided to this spot. That name was never known locally and in the 1930's, at least, the *cañadón* was known as "Lobo" (meaning "seal," not "wolf"). Tournouër

found a few fossils there, but more at Collhué-Huapí. Dealing with those fossils, Gaudry applied the name Casamayor to the formation now known by that name, which in turn has given its name to the Casamayoran stage and age. (On the Tournouër Collection and Gaudry's studies see Simpson, 1965.)

It has generally been assumed that Casamayor is a major locality for Casamayoran fossils, but such is not the case. The Ameghino Collection contains only one, unidentified specimen labeled as from there. Tournouër, most successful, found about a dozen identifiable specimens (described in Simpson, 1965). Loomis found only unidentifiable scraps (Loomis, 1914b), and Riggs and, later, I found just enough to confirm the presence of Casamayoran (Simpson, 1948, and in press). Even Don Carlos was confused on this one point, for he insisted that this is a rich site. When I pointed out that his collections contain only one poor specimen labeled as from there, he indicated another as also from there, but in fact that was neither from Casamayor nor collected by him. (This was the only out-and-out error in his discussions with me.) Don Carlos added that the richest level is exposed only at low tide on the wave-cut bench ("restinga"), but in fact the whole thickness of the type Casamayoran Formation is exposed, and practically barren of fossils, along the shore. The only identifiable fossils positively known to come from that area are from somewhat inland, in Cañadón "Tournouër" or Lobo.

Other supposed localities. Carlos' sketch map (Fig. 1 here) shows two other large areas of outcrops as "notostylopéen" or Casamayoran, but he told me that these had been identified on stratigraphic grounds only and that he had never found identifiable fossils in them. There are no specimens so labeled in the Ameghino Collection or specified in Florentino's publications. To my knowledge, there is likewise no trustworthy later report of identifiable pre-Deseadan mammals in either place. One is

on the Río Deseado between Pico Truncado and Jaramillo, and the other on the Río Senguerr west of the central lakes and of the Sierra San Bernardo.

Von Huene (1929, p. 16) wrote that, "A 50 o más kilómetros de aquí [western part of the Sierra San Bernardo], hacia el norte, se encuentran los lugares de hallazgos de los bellos y completos cráneos de *Notostylops*, que se encontraron depositados en tobos cenicientos, rojizas y claras, según me ha explicado personalmente don Carlos Ameghino al mostrarme esos cráneos. . . ." Some failure of communication had occurred. There is no known Casamayoran in the region indicated, none is shown on Don Carlos' sketch map, no specimens of *Notostylops* or anything else in the Ameghino Collection could be supposed to have that origin, and Don Carlos assured me that he had not made any such statement to von Huene.

MUSTERSAN LOCALITIES

Collhué-Huapí. Localities were given for extremely few of the Ameghinos' Mustersan ("astraponotéen") fossils. Three, all types, are labeled as from "Collhuapi," the same as for Casamayoran specimens from the barranca south of Lake Collhué-Huapí. Don Carlos confirmed that almost all his Mustersan specimens were from there. The sketch map for the "astraponotéen" shows three relatively small patches of exposures, all in the line that rather inaccurately indicates that barranca on the "notostylopéen" sketch map (compare Figs. 1 and 2 of this paper). The southwestern patch, evidently somewhat misplaced, may represent the western extension of the barranca known in the 1930's as Cerro Blanco, where we also found Mustersan fossils allied to "*Asmodeus*" *circunflexus*, now doubtfully referred to *Periphragmis*, the type of which is from Collhué-Huapí. (There is, however, some possibility that the type had drifted from the overlying Deseadan and represents one of the Ameghinos' extremely few errors of age determination.)

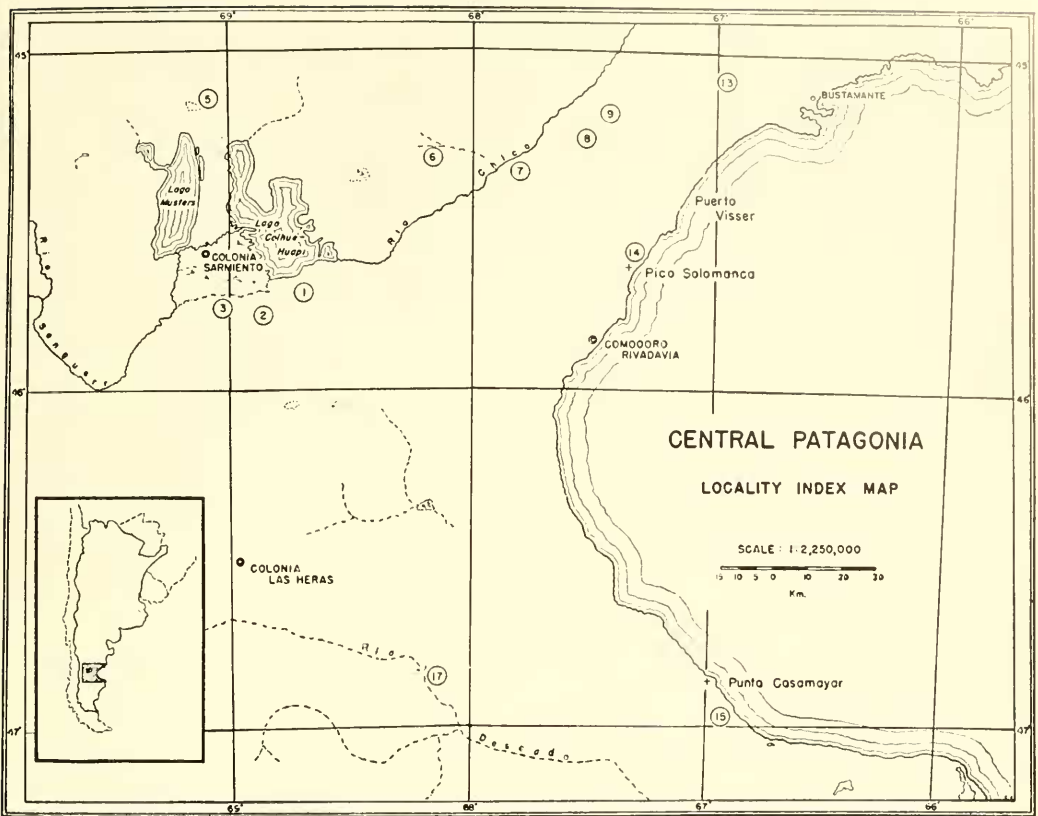


Fig. 3. Index map of central Patagonia, showing collecting localities of the American Museum expeditions (1930-1931, 1933-1934) relevant to Carlos Ameghino's earlier sites. 1, Barranca south of Lake Colhué-Huapí. 2, Kilometer 170, section similar to 1. 3, Cerro Blanco, essentially a westward extension of 1. 5, Pajarito or Cerro del Humo. 6, Cañadón Vaca, one of a series of Casamayoran localities west of the Río Chico. 7, Cañadón Hondo, one of a series of Casamayoran (and Riochican) localities east of the Río Chico. 8, Cabeza Blanca. 9, Site east of the Río Chico down the valley from Cabeza Blanca. 13, Las Violetas, in the region of Carlos Ameghino's "Malaspino." 14, Pico Solomanca. 15, Cañadón Lobo ("Cañadón Tournouër"). 17, Pico Truncado. (Slightly modified from Simpson, 1948, fig. 1.)

Colhuapi norte. This is the only other Mustersan locality on Don Carlos' sketch maps or on the specimen labels. It is the same as a Casamayoran locality and its dubious location has been discussed above.

SUBDIVISION OF CASAMAYORAN AND POSSIBLE REFERENCES TO RIOCHICAN

Florentino Ameghino at one time (1902) gave generic lists supposedly distinctive of a "Notostylopense superior" and "inferior," but later (1906), while still considering that

three or perhaps four successive faunas occur, he united these into one "grande faune." A few specimens, mostly from Colhué-Huapí, were designated in publication or on labels as from the upper or the lower "notostylopense" or "notostylopéen." However, these do not suffice to distinguish separable faunas. In general, Don Carlos did not attempt to separate fossils of one "grande faune" by levels; when he collected, the desirability of such minor subdivision was not evident and with his facilities (or lack of them) its practicability was

slight. In fact, even though recent collections are exactly placed in stratigraphic sections and it seems highly probable that known Casamayoran covers an appreciable span, no distinct faunal succession has yet been established (e.g., Pascual, 1965).

F. Ameghino also referred to a "basal" "Notostylopense" or "Notostylopéen," without making it quite clear what sediments were meant to be included. He further stated that the Salamanean is limited (at its upper boundary) by "un ruban de grès à gros grains mélangés . . . avec des os . . . de Mammifères de la faune du *Notostylops*." He added that, "Une des plus intéressantes localités de ce ruban, est celle découverte par M. Roth en face de Gaiman . . . avec des dents et des ossements de Mammifères de la faune notostylopéenne, tels que *Notostylops*, *Polydolops*, *Didolodus*, *Adpithecus*, *Trigonostylops*, etc." (Ameghino, 1906, pp. 94-95). He was thus definitely including in the "notostylopéen" and perhaps, but not explicitly, as "basal" the beds that I much later (Simpson, 1933) called the Río Chico Formation. Most of the information, here and elsewhere, cited by F. Ameghino as coming from Roth was incorrect, perhaps even willfully so, as Roth and the Ameghinos were not invariably on good terms. It is true that Roth found a few mammals in sandstones near Gaiman, a settlement on the Chubut River, but the cited genera were not found, even according to Roth's identifications. Roth (1908) reported none of the genera named by Ameghino but two supposedly new genera, one perhaps synonymous with *Henricosbornia* (including "*Polystylops*") and one with *Isotemnus*. Roth did also have a specimen perhaps belonging to *Polydolops*, but none of the other genera reported by Ameghino (see Simpson, 1935a, b).

F. Ameghino's statement seems to imply that he also had specimens of the *Notostylops* fauna from the sandstone that he considered a shore facies of the Salamanean and that this was part of his "notostylopéen," perhaps the "notostylopéen basal." In fact this seems to have been an error based either

on a misunderstanding or a deliberate misstatement from Roth and not on observations by Carlos or specimens collected by him. The Río Chico Formation, which of course is to be distinguished from the Riochican stage and age, is composed of detrital clays, sandstones and conglomerate. The Casamayor Formation, likewise as distinct from the Casamayoran stage and age, is entirely composed of volcanic bentonites and tuffs. The difference in aspect is so complete and striking that it cannot possibly be missed by the most casual observer, let alone as keen an observer as Carlos Ameghino. He categorically assured me that all his specimens referred to the *Notostylops* fauna were from the volcanic beds and that he never found a mammalian fossil in any lower beds. There is no fossil mammal in the Ameghino Collection similar in aspect, in adhering matrix, or as far as definitely determinable in species to known fossils from the Río Chico Formation. Incidentally, although the extreme uppermost beds of the Río Chico do have some genera in common with the Casamayor, *Notostylops* is not among them as far as yet discovered.

Caroloameghinia mater and *C. tenue* were published as from the "basal" *Notostylops* beds. The type specimens now have no associated horizon or locality data. Definitely identifiable referred specimens of each species are from the Casamayor Formation, and the genus has not been found in the Río Chico Formation (see Simpson, 1948). The type of *Pantostylops typus* is also labeled as from the "Partie basale" of the *Notostylops* beds, but this is a synonym of *Henricosbornia lophodonta*, a rather common Casamayoran species. The Ameghinos' three type specimens here in question almost certainly were from the Casamayor, and the unique reference to them as not only "inferior" but "basal" evidently means only that they were near the bottom of the Casamayor tuffs, not that they were in the Río Chico beds. As noted in discussing the species (Simpson, 1948, p. 165), the type of *Othnielmarshia lacunifera* has a word on

the label that may be "cuarcito" (quartzite), which could apply to Río Chico sandstone rather than to coarse Casamayor tuff. However, we found the species abundant in definitely Casamayor beds in the general area of the type locality ("Oeste de Río Chico"), where, furthermore, we found no Río Chico exposures. This specimen, too, is almost certainly from the typical Casamayor tuffs.

Whatever concept Don Florentino may have intended by "notostilopense basal," it was not based on fossils from the Río Chico Formation, and his *Notostylops* fauna did not include any species of Riochican age.

Confusion on these points was later compounded by the application of the name "Pehuenche" by Argentine government geologists and others to the beds now called Río Chico, the type Pehuenche being in fact entirely distinct and much earlier in age. Cabrera (1936) shared that confusion and also concluded that the Riochiquense, a virtual synonym of Pehuenche in this mistaken sense, may be equivalent to "una buena parte del Notostilopense de Ameghino." Debate on that point is made superfluous by the facts that none of the Ameghino's fossil localities were in the beds in question and that they had no valid evidence for referring them to the "Notostilopense." (Cabrera referred a number of fossils from the uppermost Río Chico to Casamayoran species, but those are what might be called negative identifications: the specimens were not specifically identifiable on available data and were referred to species from which they could not be certainly distinguished but without positive evidence of pertinence to those species.)

LOCALITY DATA OF TYPE SPECIMENS

The following list includes the names of all Ameghino's Casamayoran and Mustersan mammalian type specimens for which I have been able to find locality data. Listing is first by family and within families in alphabetical order of the names first applied by Florentino Ameghino. When appropriate, that is followed in parentheses by

the name used by me (Simpson, 1948, and in press) for the taxon to which I now refer Ameghino's type, if that name is different from the one first attached to his type by Ameghino. Available locality indications are given by the following abbreviations:

- C.H.—Collhué-Huapí.
- C.H.N.—Collhué-Huapí norte.
- E.R.C.—Este de Río Chico.
- O.R.C.—Oeste de Río Chico.
- P.S.—Pico Salamanca.
- R.C.—Río Chico.
- R.C.M.—Río Chico, frente a Malaspina.
- R.C.P.—Río Chico, yacimiento de *Pyrotherium* (around Cabeza Blanca).

Faunas or levels are indicated as follows:

- Ca.—Casamayoran.
- Ca.S.—Upper Casamayoran.
- Ca.L.—Lower Casamayoran.
- Mu.—Mustersan.

It is known that types of all pre-Deseadan species described in 1897 were from Collhué-Huapí and they are listed as such even though not so labeled in the collection.

Names as first proposed by Ameghino that do not appear in this list were based on specimens for which I have no field data.

MARSUPIALIA

Didelphidae

Ideodelphis microscopicus. C.H., Ca.

Borhyaenidae

Arminiheringia auceta. C.H.N., Ca.

A. contigua (*A. cultrata*). C.H., Ca.

A. cultrata. C.H., Ca.

Dilestes dilobus (*Arminiheringia auceta*). C.H.N., Ca.

Nemolestes spalacotherinus. C.H.N., Ca.

Procladostictis erecta ("P." *erecta*). C.H.N., Ca.

Pseudocladostictis determinabile. C.H., Ca.

?Caenolestidae

Progarzonia notostylopense. C.H., Ca.

Polydolopidae

Amphidolops serrifer (*Polydolops serra*). C.H., Ca.

Amphidolops serrula. C.H., Ca.

Pliodolops primulus (*Polydolops primulus*). C.H., Ca.

Polydolops crassus (*P. thomasi crassus*). C.H., Ca.

Polydolops fur (*P. thomasi thomasi*). C.H., Ca.

Polydolops serra. C.H., Ca.

Polydolops simplex (*P. thomasi thomasi*). C.H., Ca.

Polydolops thomasi. C.H., Ca.

Pseudolops princeps (*Polydolops princeps*). C.H., Ca.

EDENTATA

Dasypodidae

Anteutatus lenis (*Utactus lenis*). ?C.H., Ca.S.

Coelutactus cribellatus. R.C., Ca.

?*Machlydotherium sparsus* (*M. sparsum*). C.H., Ca.S.

Meteutatus percarinatus. C.H., Ca.S.

Orthutactus clavatus (*Utactus buccatus*). C.H., Ca.I.

Orthutactus crenulatus (*Utactus buccatus*). C.H., Ca.S.

Parutactus chicoensis (*Utactus buccatus*). C.H., Ca. [The specific name strongly suggests a Río Chico locality, but the label with the type has "Colhuapi."]

Parutactus chusus (*Utactus buccatus*). C.H., Ca.S.

Parutactus signatus (*Utactus buccatus*). C.H., Ca.S.

Posteutatus indemnis (*Utactus buccatus*). C.H., Ca.S.

Posteutatus indentatus (*Utactus buccatus*). C.H., Ca.S.

Posteutatus scabridus (*Utactus buccatus*). C.H., Ca.S.

Prostegotherium astrifer. C.H., Ca.S.

Prostegotherium notostylopianum. C.H., Ca.S.

Pseudostegotherium chubutanum. C.H., Ca.S.

Utactus argos (*U. buccatus*). R.C.M., Ca.

Utactus buccatus. C.H., Ca.S.

Utactus deustus. C.H., Ca.S.

Utactus latus. O.R.C., Ca.

CONDYLARTHRA

Didolodontidae

Didolodus colligatus (*D. multicuspis*). C.H., Ca.

Didolodus multicuspis. C.H., Ca.

Emeocoonus parvidens. O.R.C., Ca.

Euprogonia patagonica (*Ernestokenia patagonica*). C.H.N., Ca.

Euprogonia trigonalis (*Ernestokenia trigonalis*). C.H.N., Ca.

Lambdaconus mamma (*Paulogervaisia mamma*). C.H., Ca.S.

Lambdaconus porcus (*Paulogervaisia porca*). C.H., Ca.S.

Louchoconus lanceolatus (*Didolodus multicuspis*). C.H., Ca.

Nephacodus latigonus (*Didolodus latigonus*). O.R.C., Ca.

Paulogervaisia inusta. C.H., Ca.S.

Proectocion argentinus. C.H., Ca.

Proectocion precisus. C.H., Ca.

Prohyrachtherium medialis (*Archaeohyrachtherium mediale*). O.R.C., Ca.

LITOPTERNA

Macraucheniidae

Amilnedwardsia brevicula. O.R.C., Ca.

Anisolambda longidens (?*Victorlemoinca longidens*). O.R.C., Ca.

Ernestohaekelia acutidens. O.R.C., Ca.

Rutimeyeria condifera. C.H., Ca.

Victorlemoinca labyrinthica. O.R.C., Ca.

Victorlemoinca emarginata. O.R.C., Ca.

Proterotheriidae

Guilielmofloweria plicata. C.H., Ca.

Josepholeidya adunca. O.R.C., Ca.

Josepholeidya deculca. C.H., Ca.

Ricardolydekkeria praerupta. C.H., Ca.

Ricardolydekkeria profunda. C.H., Ca.

NOTOUNGULATA

Henricosborniidae

- Henricosbornia alouatina* (*H. lophodonta*). O.R.C., Ca.
Henricosbornia subconica (*H. lophodonta*). O.R.C., Ca.
Othnielmarshia lacunifera. O.R.C., Ca.
Pantostylops incompletus (*Henricosbornia lophodonta*). O.R.C., Ca.
Pantostylops minutus (*Peripantostylops minutus*). O.R.C., Ca.
Pantostylops typus (*Henricosbornia lophodonta*). O.R.C., Ca.
Polystylops amplus (*Henricosbornia lophodonta*). O.R.C., Ca.
Polystylops progrediens (*Henricosbornia lophodonta*). O.R.C., Ca.
Postpithecus curvicrista (*Othnielmarshia curvicrista*). O.R.C., Ca.
Postpithecus reflexus (*Othnielmarshia reflexa*). O.R.C., Ca.
Selenoconus agilis (*Peripantostylops minutus*). O.R.C., Ca.
Selenoconus centralis (*Henricosbornia lophodonta*). O.R.C., Ca.
Selenoconus senex (*Henricosbornia lophodonta*). O.R.C., Ca.
- Notostylopidae
- Acrostylops pungiuunculus* (*Homalostylops parvus*). C.H., Ca.
Catastylops deflexus (*Notostylops deflexus*). C.H., Ca.
Catastylops pendens (*Notostylops pendens*). O.R.C., Ca.
Entelostylops appressus (*Notostylops appressus*). R.C.P., Ca.
Entelostylops completus (*Notostylops murinus*). C.H., Ca.
Entelostylops incolumis (*Homalostylops parvus*). C.H., Ca.
Entelostylops tripartitus (*Notostylops murinus*). O.R.C., Ca.
Eostylops diversidens (*Notostylops diversidens*). C.H.N., Ca.
Homalostylops interlissus. C.H.N., Ca.
Homalostylops rigeo (*H. parvus*). C.H., Ca.
Isostylops fretus (*Notostylops murinus*).

C.H., Ca.

- Notostylops ampullaceus* (*N. murinus*). C.H.N., Ca.
Notostylops aspectans (*N. murinus*). O.R.C., Ca.
Notostylops bicinctus. C.H., Ca.
Notostylops chicoensis. C.H., Ca. [Despite the specific name, the type is definitely labeled Colhué-Huapí.]
Notostylops murinus. C.H., Ca.
Notostylops parvus (*Homalostylops parvus*). C.H., Ca.
Notostylops promurinus (*N. murinus*). C.H., Ca.

Oldfieldthomasiidae

- Acoelodus connectus* (*Paginula parca*). O.R.C., Ca.
Acoelodus oppositus. C.H., Ca.
Acoelodus proclivus. C.H., Ca.S.
Antepithecus plexostephanos (*Maxschlosseria minima*). O.R.C., Ca.S.
Eochalicotherium minutum (*Maxschlosseria minuta*). O.R.C., Ca.
Eostylops obliquatus (*Maxschlosseria consumata*). C.H., Ca.
Isotemnus consumatus (*Maxschlosseria consumata*). O.R.C., Ca.
Isotemnus emundatus (*Maxschlosseria rusticula*). O.R.C., Ca.
Maxschlosseria anatona (*M. minima*). O.R.C., Ca.S.
Maxschlosseria praeterita. O.R.C., Ca.I.
Oldfieldthomasia anfractuosa. C.H.N., Ca.
Oldfieldthomasia cingulata (*O. debilitata*). C.H., Ca.
Oldfieldthomasia conifera (*O. debilitata*). C.H., Ca.
Oldfieldthomasia cuneata (*O. debilitata*). C.H., Ca.
Oldfieldthomasia furcata (*O. debilitata*). C.H., Ca.
Oldfieldthomasia marginalis (*Maxschlosseria rusticula*). O.R.C., Ca.
Oldfieldthomasia parvidens. C.H., Ca.
Oldfieldthomasia plicata (*O. debilitata*). C.H., Ca.
Oldfieldthomasia pulchella (*O. parvi-*

dens). C.H., Ca.

Oldfieldthomasia septa (*Maxschlosseria septa*). O.R.C., Ca.

Oldfieldthomasia transversa. C.H., Ca.

Paginula parca. O.R.C., Ca.

Pleurostylodon minimus (*Maxschlosseria minima*). O.R.C., Ca.

Ultrapithecus rusticulus (*Maxschlosseria rustica*). O.R.C., Ca.

Ultrapithecus rutilans. C.H., Ca.

Archaeopithecidae

Adpithecus plenus (*Archaeopithecus rogeri*). C.H., Ca.

Archaeopithecus alternans (*Acropithecus rigidus*). O.R.C., Ca.

Archaeopithecus rigidus (*Acropithecus rigidus*). O.R.C., Ca.

Archaeopithecus rogeri. C.H., Ca.

Notopithecus fossulatus (?*Archaeopithecus fossulatus*). C.H., Ca.

Interatheriidae

Adpithecus subtenuis (*Notopithecus adapinus*). C.H., Ca.I.

Antepithecus brachystephanus. C.H., Ca.

Antepithecus imexus (?*A. imexus*). C.H., Ca.

Antepithecus interrarus (*A. brachystephanus*). C.H., Ca.

Epipithecus confluentis (*Notopithecus adapinus*). P.S., Ca.

Gonopithecus trigodontoides (*Notopithecus adapinus*). O.R.C., Ca.

Infrapithecus cinctus (*Antepithecus brachystephanus*). C.H., Ca.

Infrapithecus diversus (*Notopithecus adapinus*). C.H.N., Ca.

Notopithecus adapinus. C.H., Ca.

Transpithecus obtentus. C.H., Ca.

Archaeohyracidae

Eohyrax isotemnoides. C.H., Ca.

Eohyrax praerusticus. C.H., Ca.

Eohyrax rusticus. O.R.C., Ca.S.

Isotemnidae

Amphitemnus nucleatus (*Isotemnus primitivus*). C.H., Ca.

Amphitemnus transitorius (*Isotemnus primitivus*). C.H., Ca.

Anchistrum sulcosum (*Pleurostylodon modicus*). C.H., Ca.

Anisolambda latidens (*Isotemnus latidens*). C.H.N., Ca.

Asmodeus circumflexus (?*Periphragis circumflexus*). C.H., Mu.

Coelostylops crassus (*Pleurostylodon similis*). O.R.C., Ca.

Dialophus recticrista (?*Pleurostylodon recticrista*). O.R.C., Ca.

Dialophus simus (*Pleurostylodon modicus*). P.S., Ca.

Dimerostephanus attritus (*Pleurostylodon modicus*). C.H., Ca.S.

Dimerostephanus colluchhuapensis (?*Isotemnus colluchhuapensis*). C.H., Ca.S.

Eochalicotherium crassidens (*Isotemnus latidens*). O.R.C., Ca.

Eochalicotherium robustum (*Isotemnus latidens*). O.R.C., Ca.

Isotemnus apicatus (*I. latidens*). O.R.C., Ca.

Isotemnus conspicuus (*I. primitivus*). C.H., Ca.

Isotemnus distentus (*Anisotemnus distentus*). P.S., Ca.S.

Isotemnus enecatus (*I. latidens*). O.R.C., Ca.

Isotemnus lophiodontoides (*Anisotemnus distentus*). O.R.C., Ca.

Isotemnus primitivus. C.H., Ca.

Paratemnus geminatus (*Pleurostylodon modicus*). C.H., Ca.

Pleurostylodon dirisus (*P. modicus*). C.H., Ca.

Pleurostylodon obscurus (*P. modicus*). R.C., Ca.

Plexotemnus complicatissimus (*Acoclohyrax complicatissimus*). C.H., Ca.

Porotemnus crassiramis (?*Pleurostylodon crassiramis*). C.H., Ca.S.

Thomashuxleya externa. E.R.C., Ca.

Thomashuxleya robusta. C.H., Ca.

Trimerostephanus angustus (*Isotemnus primitivus*). C.H., Ca.

Trimerostephanus bicornis (*Pleurostylo-*

don biconus). C.H., Ca.

Trimerostephanus sigma (?*Acoelohyrax sigma*). C.H.N., Mu.

Tychostylops marculus (*Pleurostylodon modicus*). C.H., Ca.

Tychostylops simus (*Pleurostylodon similis*). C.H., Ca.

Notohippidae

[No locality data for Ameghinos' specimens.]

Notoungulata incertae sedis

Carolodarwinia pyramidentata. C.H., Mu.

?*Claenodon patagonicus* ("Claenodon" *patagonicus*, not this genus). R.C.M., Ca.

Isotypotherium annulatum. P.S., Ca.S.

Lophiodonticulus patagonicus. O.R.C., Ca.S.

Lophiodonticulus retroversus. O.R.C., Ca.S.

Pleurostylops glebosus. O.R.C., Ca.

Tonostylops spissus. C.H., Ca.

wortmani). C.H., Ca.

?*Trigonostylops duplex* ("T." *duplex*). C.H., Ca.

Trigonostylops eximius (*T. wortmani*). C.H., Ca.

Trigonostylops germinalis (*T. wortmani*). C.H., Ca.

Trigonostylops hemicyclus (*T. wortmani*). C.H., Ca.

Trigonostylops insumptus (*T. wortmani*). C.H., Ca.

Trigonostylops integer (*T. wortmani*). C.H., Ca.

Trigonostylops minimus (*T. wortmani*). C.H., Ca.

Trigonostylops scabellum (*T. wortmani*). O.R.C., Ca.

Trigonostylops secundarius (*T. wortmani*). C.H., Ca.

Trigonostylops subtrigonus (*T. wortmani*). R.C., Ca.

Trigonostylops trigonus (*T. wortmani*). C.H., Ca.

Trigonostylops wortmani. C.H., Ca.

ASTRATHERIA

Astratheriidae

Astraponotus assymetrus. C.H.N., Mu.

TRIGONOSTYLOPOIDEA

Trigonostylopidae

Albertogaudrya oxygona (*A. unica*). C.H., Ca.S.

Albertogaudrya regia (*A. unica*). C.H.N., Ca.S.

Albertogaudrya separata (*A. unica*). C.H., Ca.S.

Albertogaudrya tersa (*A. unica*). C.H., Ca.S.

Scabellia cyclogona (*Albertogaudrya unica*). C.H., Ca.

Scabellia laticincta (*Albertogaudrya unica*). C.H., Ca.

Trigonostylops columifer (*T. wortmani*). C.H., Ca.

Trigonostylops coryphodontoides (*T.*

PYROTHERIA

Pyrotheriidae

Carolozittelia eluta. Published as from the lower part of the *Pyrotherium* beds (Descadan), "Oeste de Río Chico, cerca Chubut," but may be from the Casamayoran.

Carolozittelia tapiroides. O.R.C., Ca.

Promoeritherium australe. C.H., Mu.

Mammalia incertae sedis

Anagonia insulata. C.H., Ca.S.

Proplanodus adnepos. C.H., Ca.S.

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